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FOR YOUR SCRAP BOOK

The avaricious man is like the barren, sandy ground of the desert, which sucks in all the rain and dews with eagerness, but yields no fruitful herbs or plants for the benefit of others.—Zeno.

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EDITORIAL

Is the art of electroplating becoming less an art, and a mere commercial process? It appears to be a fact with respect to certain branches of the industry. Some one has said, "The love of work is a natural instinct, and to deprive a man of the opportunity to work is a crime. But it is a greater crime to prevent men from producing something worth while. To make them lose sight of art, skill or quality by insisting upon poor workmanship is degrading and discouraging. Men of character devote their lives to the work they love. They take great pride in the work they produce if it is good. Every accomplishment spurs them on to greater effort.

How it must hurt the particular individuals who take pride in the work they love to have some person tell them anything will do—"production is what we want." How discouraging when one must lose sight of all art, skill, beauty and craftsmanship which took years to acquire in order to earn a livelihood. We often wonder why there are not more men than there are who lose interest in their particular profession or occupation when they are not given the opportunity to use that which they possess to produce the best or highest in their particular line."

Those words are applicable to many of the electro-plating positions on this continent today. Is the answer—Competition? No, the answer is—The electroplater by reason of the broadening influence of the American Electro-Platers' Society will meet the situation with the spirit of progress and unite with the manufacturers in making the plated products of 1927 cheaper, but equally as durably finished as before the great war. Then in the future years when the rush and scrimmage is over and we have more time to think, experiment and devise we can put art into every article we produce.
—Associate Editor W. S. Barrows, Past Pres. A. E. S.

IRONING OUT A FEW WRINKLES

By Jerry De Grazio

(Continued from December)

Removing Red Spot From Brush Brass Work

After some of the brush brass pieces are finished and dried in sawdust, some red copper spots appear on the surface of the pieces. This mostly happens on brass castings, either brass-plated or solid brass. I have had considerable of this trouble with lamp basis. The best way I have found in removing these spots is by the sulphurett of potassium oxidizing dip. The method to proceed is as follows: After the pieces are scratch-brushed and dried in sawdust, if they appear with red copper spots on them give them a dip in the oxidizing solution until these spots turn black or dark brown; then take out and rinse in water; then dip in cyanide dip for a short time until these spots are removed; then rinse again and dry in the usual way. These spots will disappear entirely.

Brass Plating

Too much free cyanide in mechanical brass oslution.

In my experience with the above, I find that when a mechanical brass solution contains too much free cyanide and at the same time there is enough metal in it, the brass work being plated receives no deposit. Add from ¾ to 1 pound of ammonium chloride (NH_4CL), dissolve in water and add to the brass solution. This will destroy part of the free cyanide and a good brass deposit will follow. Do not add more of the ammonium chloride than is necessary, or this will bring up the zinc and will cause the solution to plate zinc red; sometimes the work will plate pale with dark spots on them. The above amount is enough for an 80 to 100 gallon solution.

Too much ammonium chloride in a mechanical brass solution will cause a zinc basic deposit on the anodes which will gradually slow up the deposit and plating will be of a reddish color, which would make one believe that the solution is in need of zinc, and oftentimes one gets into trouble by adding it to the solution. A few sticks of caustic soda with a small amount of cyanide added to the solution will soon clear the anodes and will bring out a good brass deposit.

Another thing I found that must be avoided, and that is too much caustic acid. This is also troublesome. It has a

tendency to bring up the copper and make the deposit too red. You will also find that it is very hard to regulate the color of the deposit. It is always best to add it in small amounts until the desired results are obtained.

There is one confusing part about a mechanical brass solution, and that is when the solution is plating a reddish color on the pieces inside of the cylinder at the same time the deposit on the outside of the cylinder is a rich brass color. To make this more clear—if the cylinder is taken out of the tank and connection is made as for a still solution, a few pieces are hung in and plated on wires, a beautiful brass color was plated in a very short time.

I overcame this trouble by adding from 1½ to 2 oz. of copper cyanide dissolved in sodium cyanide to each gallon of solution, after which I would obtain a good brass deposit on the work in the cylinder.

This has been quite a puzzle to me why I received a red deposit on the work inside the cylinder and brass on the outside; then, by adding more copper to the solution, I again obtained a brass color. There might be a good reason for the work to plate red inside the cylinder on account of the resistance inside the barrel.

Why do I obtain a brass color by adding more copper with the voltage and ampere the same?

I would like to have the above matter discussed at the convention and facts published in our Monthly Review.

Producing Statuary and Jap Bronze Finish

In producing the above finishes I do not wish to create an idea that I have something new to offer or know more about it than the other fellow.

But in producing this finish on production basis I might bring out a few points that may be interesting to some fellow member that happens to be doing the same class of work. The class of work we have for the dark finishes such as Jap bronze and statutary bronze and a few of the others that are in the same class.

All brass pieces are buffed, strung up and cleaned in the usual manner, and are plated in the acid copper solution for a few minutes. It usually takes about five minutes to get the desired coating of copper to receive the proper finish

They must not be allowed to take on too heavy a coat of copper or it will not bring out the beautiful, lustrous finish after they are scratched, brushed and lacquered.

Why I mentioned the acid copper bath for this class of work is because in my long experience in producing the above finish I have always found the acid copper solution to be superior to the cyanide copper solution in this respect.

There are several reasons for me making this statement; first, is the acid copper deposits pure copper and can be oxidized with safety without any streaks or uncovered spots if the right manipulations are carried out.

The work plated in the cyanide copper solution may be oxidized just as well to a certain extent, but it has not that beautiful appearance as the articles being plated in the acid copper bath. There are times when work being plated in the cyanide copper solution will not take on an even coating of black in the liver of sulphur dip; there are spots that do not cover and these show up more after they are brushed. Of course, I do not mean that all cyanide copper solution will do this. This mostly happens in a solution where there is a considerable amount of zinc articles being plated and a lot of other soft metals. Some of the zinc is being reduced by the cyanide in the solution, and this will be plated on other articles with the copper. It is not noticeable to the eye, but when you try and make a good job of oxidizing on them while the articles appear pretty well covered all over when you go and scratch brush them, the uncovered spots will appear and the job will have to be done over. This is never the case with the acid copper solution.

If a good statuary bronze or any other relative finish, I would always recommend the use of the acid copper bath. I am plating and finishing brass and iron pieces by the thousands in the above finishes and very seldom have to do any of them over.

Now I must get back where I left off. As I stated before, the pieces must not be allowed to get on too heavy a coating of copper. When the deposit appears with a semi-gloss they are taken out of the solution, rinsed in water thoroughly, because it is through improper rinsing that most of our trouble happens in finishing. After they are given a good rinsing they are given a momentary dip in the liver of sulphur dip just long enough so they are all covered with a reddish tint.

Now take out, rinse in water, immerse in cyanide dip until all fo red tint is removed, rinse again in water thoroughly and then dip into the liver of sulphur until you get the desired color; then quickly take out, rinse in water and dry in sawdust, or any other drying method.

The reason for the second dip in the oxidizing solution is that the finish comes out clearer and without a streak or blemish.

In using liver of sulphur get the best obtainable, one that does not decompose while in the can.

In drying the work after it is blackened, instead of sawdust I would recommend the hot-air drying system, especially where a steady run of this work is being done. The method we use for drying this kind of work or any pieces which are too thin and do not hold the heat very long after they come out of the hot water and before you get to the sawdust box they are cold, which would take quite a while to dry and, besides this, is very inconvenient, as you cover yourself with sawdust both inside and out, for you also inhale this dust, which makes you feel quite disagreeable.

We have a large sheet metal box about four feet square and six feet high, in which there are radiators. This box is closed on top. Under this is an opening in which we have a 30-inch fan. On the upper side of the box there is a 10-inch opening in which is fastened a 10-inch sheet metal pipe. This pipe runs from the radiator box to a distance of about fifteen feet. Here we have a large metal box or oven about eight feet long and four feet wide and seven feet high. In here we have hooks and other conveniences for drying our work. Then 10-inch pipe that comes from the radiator box enters in one end of the oven.

Now when these radiators get heated from the main steam pipe, the fan is turned on and the hot air is shot through the pipe and into the oven where our work is hung to dry. This way we get the highest efficiency, no sawdust to fool with and the hands never touch the work until it is dry. They are then taken off the wires and scratch brushed and lacquered.

In scratch brushing all the dark finishes, or even silver, we never use a brass wire brush. I have found the steel wire wheel the best for this purpose. It does not leave that brassy effect on some of the work.

Basket Plating Small Brass Pieces in the Acid Copper Solution

Small brass pieces such as screws, nuts and many others that require copper plating either to remain copper or for other black finishes.

If one tries to copper-plate them in a brass mesh plating basket direct in the acid copper solution after the usual cleaning, one would not get very far. I have tried it and have had very little success. The parts that do not touch each other might receive a thin coating of copper, but when a large amount is put in the basket they cannot help touching one another, and it will be a hard propositon to get them to plate all over.

The best method I have found, and it works quite successful, is to hang the basket with the articles in the nickel tank first and give them a coating of nickel; leave them in until they are pretty well covered with nickel, then take them out and rinse in water and hang in acid copper solution. In about ten or fifteen minutes they will have a pretty fair coat of copper and can be blackened for jap bronze or anything they might call for. Of course, if there is a large quantity of this small work it would pay to put in a mechanical cyanide copper solution. I am speaking only of the shop that is not equipped with cyanide copper solution, either still or mechanical.

JERRY DeGRAZIA,
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CHEMICAL CONTROL OF PLATING SOLUTIONS

George B. Hogaboom

To many the learning of the methods for controlling the contents of electroplating solutions is considered a long, difficult task. The methods of analyses as outlined in a beginner's book on chemistry are to a layman intricate and require more than ordinary skill to even comprehend enough to be of assistance in a practical way in a plating room. The symbols, equations, and chemical terms are viewed as a part of a strange, incomprehensible language that can only be understood by those who have been trained in the halls of learning where Latin, Greek, Egyptian hieroglyphics and mathematics are taught. This was confirmed by some who, realizing the value of chemistry as applied to electroplating, endeavored to study alone and without the aid of a laboratory.

There were others that sought the advice of trained chemists and were told that it would not be possible to gain the goal sought unless competent instruction was had in the fundamental principles of chemistry. It was difficult to find a suitable instructor. The chemist knew as little about the practical side of electroplating as the plater did about the principles of chemistry. Those who did attempt to teach planned a course of study similar to what they had been taught. It was considered essential that valence, the balancing of equations, the qualitative determination of unknown solutions and such things, be thoroughly understood before the gravimetric or volumetric analysis be studied. When it is realized that it takes two years of a college course to prepare a student for quantitative analysis the task before the plater was beset with many difficulties. Working all day as a plater, which means at times being a machinist, an electrician, an artist, a production supervisor, and above all, a good executive understanding how to teach and direct those who at times are almost unteachable, consumes mental and physical energy. To then give up the required hours of rest in evenings and Sundays to study the reaction of some chemical combination that never would be of practical value in a plating room, demands a sacrifice that many are not willing or even able to make.

The need of training in chemistry was clearly recognized. It was well known that with the advancements made in the electro-deposition of metals that unless the plater became adept enough to control the plating solutions by analysis that the chemist would replace him and that he would become an ordinary production man. This was already being done. Yesterday the manufacturer accepted plating troubles as unavoidable. Today he is seeking men trained in chemistry to operate his plating room. Tomorrow he will demand them.

The knowledge that electroplating is no longer a mystery, and that solutions and methods of operation are subject to definite scientific laws is becoming more and more general. Soon it will be common knowledge, and to many platers this will be a crisis. In all crises, however, a way of action can always be found. As the development of electroplating was brought about by the platers themselves, as members of the A. E. S., it is not strange that a plater, rather than a chemist, should point out the way.

This plater reasoned that it is not necessary to be a mechanical or combustion engineer to operate an automobile. A small kit of selected tools, a set of instructions and an instructor to teach the use of the tools and how to operate the driving mechanism converts a man into an automobile engineer. When troubles beyond comprehension develop, the garage with its expert engineers is available. The same plan is applicable to the electroplater. A small kit of tools—glass ware—and chemical reagents—a set of instructions and an instructor to teach how to use the tools and how to interpret the results will convert a plater into an electroplating chemist. He need not know the fundamental principles of chemistry any more than a man driving a car need to know about the fundamental principles of combustion engineering. He need only to master the mechanics of the operations involved.

The Sizelove plan is to teach the plater the mechanics of analyses of plating solutions. Volumetric methods for analysis of all solutions used in the plating room have been worked out and published in the March, 1926, Monthly Review. The necessary beakers, pipettes, burettes and chemicals are easily obtainable.

The plan was tried out successfully in a vocational school and the average attendance of plating room foremen for a year was above 80 per cent, a direct contrast to the dwindling attendance of classes where fundamental principles of chemistry was taught. The plater students were given the necessary tools of glassware and reagents, a set of instructions, and Mr. Sizelove was the instructor. Standard solutions for titration were made and furnished the student; it was not necessary for him to master the details of making and checking these, although this instruction was available. In one term of 120 hours platers without any previous knowledge of chemistry became proficient enough in the mechanics of analysis to control the solutions in their plating room. As fast as the method for one solution was mastered it was put into practice and the old saying, "Practice makes perfect," was never more true, and today these men control their solution, not by the rule of thumb but by actual chemical analysis.

The teaching of chemistry to platers, with a fagged brain, after a trying day's work was a failure. The Sizelove plan is a success and in every branch classes should be formed and

analysis of solutions taught by this method. It means not only progress but the only way by which the plater can successfully hold his job in the modern plating room. This plan will be the means of salvaging many men who will otherwise be retired in the near future.

It is recognized that all the members of the A. E. S. cannot attend the meetings of a branch society. There are many in places where distance prevents attendance. These platers are just as anxious to have the opportunity of learning how to control their solutions as their more fortunately situated brother platers. Neither is it possible for the branch societies to provide instruction for these platers. This has been recognized by the writer of this article. He, therefore, obtained the privilege of offering the facilities of the chemical laboratory under his supervision to all platers, members of the A. E. S. who cannot attend classes in chemistry. It has been found that if two full days are given to the study of each solution, under the Sizelove plan, sufficient knowledge can be obtained so that with practice in the plating room the plater can make the necessary analysis. The tools, the chemicals and personal instruction are available to foreman platers without any cost or obligation. This is done because it is realized that chemistry in electroplating is not coming, but is here, and that the plater who does not know how to control his solutions in a few years will be the "old timer" and if he loses his job it will be difficult to get another, the other plater applying will know what he should know—control of solutions. The Sizelove plan opens the way to better plating and will make platers more successful—and you—"to be or not to be, that is the question." This is your opportunity. What is your answer?

READ AT NOVEMBER MEETING, 1926

David Ayres, Toronto Branch

Mr. President and fellow members, A. E. P. S., we will here try to give a few words of advice on the care of plating dynamos. In the first place we must consider that the dynamos in the plating room have the same relation to the rest of the equipment that the locomotive has to the express train. It is our source of power, and therefore should receive our first consideration, it should rest on a solid foundation,

and as far as possible be free from vibration, and be run at the regular speed required by the manufacturer. There are no doubt a large number of machines that are still belt-driven, but we believe the motor-driven dynamos give by far the best results.

And now we come to the commutator and brushes, which we might say can be regarded as sort of barometer at times, what we mean by that is, suppose everything has been working smoothly in the plant for some considerable time, and then the commutator of your dynamo develops a bad case of sparking and you find the brushes are also cutting. We can be sure there is something wrong and should immediately look for the cause of the trouble. The first place to look is right at the commutator and brushes themselves, are the brushes equally divided on the surface of the commutator, at times a single brush will cause all the trouble by becoming loose, and consequently is worn uneven and should be taken out and ground to the proper level, this should be done on a fine emery wheel as near the diameter of the commutator as possible, the contact surface of your brushes will then correspond very nearly with the surface of commutator and will become adjusted more quickly, and your commutator will acquire that glaze which every plater likes to see, and here we might say something to lubrication. The usual plan is a piece of felt or something similar, slightly saturated with oil, which is allowed to rest on the lower set of brushes. The best lubricant that I have found is a mixture of beeswax and plum bago about equal parts of each. Just melt the beeswax and stir in the plum bago and let cool. I have found this very satisfactory, although paraffin wax can be used when beeswax is not available. Occasionally the glaze on the surface of commutator will become so pronounced that it becomes slightly insulated, a drop of oil rubbed across the surface or a very fine piece of sandpaper will do the trick.

Now we have done about all we can do in regard to commutator and brushes, and they continue to spark and cut, well must break for a short circuit or loose connection somewhere on tank rods, or possibly a careless operator has allowed a piece of work to drop in one of the tanks and leaves it there, it rest diagonally against the anods, and when the bath is again loaded, some of the parts come in contact with

the piece submerged, the result is no end of trouble. I recall an occasion where this actually happened. We believe it to be a good method to give the dynamos a little attention at least once a day, be sure to oil regularly. In a number of plants the dynamos are enclosed in a room by themselves and are not allowed to be exposed to the moisture, and fumes from the plating room, or grit from the polishing room.

These are a few facts if followed, we feel sure will give good results.

CADMIUM PLATING

For the last few years cadmium plating has had just recognition in the manufacturing world, on account of its rust resisting qualities, its quickness of deposition and the fact that metal does not have to be heavily plated in order to withstand the various changes in atmosphere and climate to which so many articles are subjected, after they leave the factory. When we consider that 1 mil. of cadmium plate equals 3 of zinc, it would seem that cadmium plated parts would soon be in universal favor. The automobile industry should be especially interested in this process inasmuch as exposed parts, such as bumper bars, radiator shells, etc., have been the cause of considerable criticism in the past, because of the failure of nickel plate to "stand up" under ordinary conditions. Here we have a deposit which has proved its worth, held its own under severe chemical tests and will long outlast other electro deposits when exposed to atmospheric changes. Moreover a cadmium coating applied to enameled articles that can be plated is a guarantee that these articles will not rust, even should the enamel chip off. In a great majority of plating rooms it has been customary to copper strike articles of steel and iron, previous to nickel plating. A light coat of cadmium is far better as a rust preventive and does not affect the nickel deposit or the appearance of the work after being color buffed. Work that requires no previous preparation in the polishing room will take a beautiful satin finish by being wire brushed after plating a coat of clear lacquer, being applied to avoid marring the finish in handling. This is sometimes used as a substitute for silver, the deception being barely noticeable. Work that is cadmium plated by the barrel method, whether it be composed of brass, copper, iron or steel, can be

made to take a beautiful silvery appearance by keeping an excess of sodium cyanide in the plating tank or by being ball rolled after plating. It might be well to mention that cadmium plate should not be used on cutlery and cooking utensils as the nature of the metal does not harmonize with the human organism, and there is a remote possibility that the use of cadmium on articles containing food in the home, might result in rather unpleasant after effects.

To the person who undertakes cadmium plating on a small scale, such as job shop work, the experiment would very likely prove a costly one, unless this particular finish is definitely requested, but to the manufacturer who has great quantities of work to be given a rust resisting treatment, cadmium plate should make a strong appeal. There are several reasons, first, it deposits very quickly, the time of deposition being three times at least faster than nickel and twice as fast as electro galvanizing, there is no peeling or blistering to contend with if work is properly cleaned, and if by chance some pieces of work should happen to be rejected by the Inspection Department, a few minutes in a hydro-chloric acid dip will remove the deposit, and leave the surface smooth and bright so that these same articles can be replated successfully without an extra buffing operation. Another advantage is that it is easier to control this solution than some others, there being but two chemicals to contend with. This should be a source of satisfaction to many platers who have had their nickel solutions fail them when the Production Department insisted that they couldn't wait another minute for the work.

Moreover, this deposit does not require the amount of floor space for cleaning and plating tanks, etc., especially if a moving cathode machine is used.

Carefully considering these facts the logical conclusion is that even if the initial expense is greater as compared with nickel and if the chemicals and anodes used in cadmium plating cost more than a tank containing the same amount of nickel or zinc, the time saved, the amount of surface covered and the added protection of cadmium clearly proves its ultimate economy.

Regarding the process, cleaning is the most important factor in cadmium plating. This is the secret of all finishing, whether it be paint, lacquer, enameling or even soldering.

Pickling or sandblasting should be resorted to wherever there is a scaly surface, everything in the nature of oil and grease should be removed in the usual way.

Anodes, too, are important in the proper functioning of this process, three times the amount of anode surface being necessary in the tank to the amount of material being plated. Fifteen per cent of iron is required also which can very easily be made a part of the anode by using strips of cold-rolled steel, 25 in. long, 1 in. wide and ¼ in. thick, to which is fastened the cadmium disc, thus making a very substantial anode for a tank of ordinary dimensions.

The cadmium solution is made as follows, and is used with a current density of 30 amp. per square foot:

Water	100 gallons
Sodium Cyanide	85 pounds
Cadmium Oxide	28 pounds

The solution can be used either cold or hot. Where a cold solution is used there is a minimum of sodium carbonate and hydrocyanic gas formed. When the solution is heated, the gas fume thrown off becomes offensive and sometimes injurious to the operator and has to be carried off with a blower. Rubber gloves are also necessary in handling this solution as the mixture coming in contact with scratched or torn hands, causes painful sores and blisters.

A steel tank is preferable to wood, particularly in barrel plating as the solution very readily attacks anything of a nonferrous nature in the mechanical equipment. Barrels used in cadmium plating are short-lived especially when the solution is used "hot." Celluloid panels simply dissolve. Wood panels become so saturated that they seem like pulp. The only material which seems to give any degree of satisfaction is micarta and this must have a fabric base instead of paper. Micarta also has its limitations unless the panels and framework are good and thick, with all the perforations it is possible to get into the panels. The manufacturer of plating supplies need not consider his work done until he can place in the plating room a real honest-to-goodness plating barrel, which will stand the test that the cadmium solution surely gives.

The time of plating depends upon the density of the solution and the nature of the material to be plated. As in other solutions, a large anode surface is necessary and more to be

desired than the frequent adding of metal in oxide form to the solution. This also reduces the time of deposit so that a thickness of coating (.00025) should be deposited on any article in from ten to twelve minutes in a "still" solution and about thirty minutes in barrel plating.

After plating, all material should be thoroughly rinsed in clean, cold, running water, then in hot water, to which may be added a little whale oil soap, to prevent stains, (except when a subsequent lacquer or japan finish is to be applied). Small parts can be dried in sawdust or on a drying machine. Large pieces may be allowed to dry from the absorbed heat.

Tests should be made frequently for cyanide content, metal content and thickness of deposit, and are as follows:

Testing for Cyanide

Dissolve 14 grams of cadmium chloride in a little water. Add enough water to make one quart of solution. Take 5 c.c. of plating solution and put in a four-ounce bottle, fill the bottle one-third full with water and shake. Slowly add the testing solution to the diluted-plating solution with a small graduate until a distinct cloudiness appears and does not clear away. Each 5 c.c. of testing solution which is necessary to add to obtain the cloudiness means that there is one ounce of cyanide in the solution. The amount necessary to bring it up to standard can then be calculated. The solution should contain between six and seven ounces of cyanide to the gallon.

Testing for Metal

Dissolve 100 grams caustic soda in distilled water. Add 15 grams powdered sulphur and boil for a few minutes. Filter off any undissolved sulphur. Next, dilute the solution to one quart by using water. The solution is now ready for use.

To determine the metal content of plating solution, place 10 c.c. of the plating solution in one of the graduates, add 25 c.c. of the testing solution, shake thoroughly and let stand overnight. A yellow sediment will separate and settle in bottom of graduate. Each 2 c.c. of sediment means that there is in the plating solution one ounce of metal. As the solution should contain at least two ounces of metal to the gallon, any deficiency can be calculated and the proper amount of cadmium oxide added.

Testing for Thickness of Deposit

To each 100 c.c. of hydrochloric acid (C. P. or commercial

grade) which has been diluted to reach 1.135 specific gravity (17 degrees BE) add 5 c.c. of liquid butter of antimony. The butter of antimony must have a specific gravity of 1.6. The stripping solution is now ready. Place representative samples from each run in plating tank into the stripping or testing solution. As long as any cadmium remains on the article, a distinct bubbling will be seen. When the cadmium is gone, the bubbling ceases, which is to be taken as the finishing time. To be a satisfactory coating, the article being tested must bubble for forty seconds, which is equal to a thickness of coating of .00025. Not more than four samples should be dipped in the same stripping solution.

Cadmium plate is not as hard a deposit as nickel and will mar and scratch as easily as silver, it has moreover a tendency to stain easily so that the greatest care should be taken in rinsing after coming from the plating bath.

WESTINGHOUSE ELEC. & MFG. CO.,
East Springfield Works, Mass.

THE MONTHLY REVIEW

The value of any publication depends upon whether the matter presented is of a nature that will gain the goal sought. The Monthly Review—the organ of the A. E. S., an educative organization—should contain that which will add to the knowledge of the members. There should not only be the reports of the meetings of the Branch Societies, which is of general interest, but original papers on subjects that represent the best thought of the day on new or improved practice. There should also be the "news" of the plating industry throughout the world. The word "Review" implies that. A reading of the matter presented would seem to indicate that there has been a "Monthly" rather than a "Monthly Review."

In development work, in research work, in fact in the every-day shop work, it is of much importance to know what has been done or what the other fellow thought could be done. Valuable time and effort is spent in doing work that has been done and in a great many cases the data obtained has been published. There are inquisitive platers all over the world experimenting and collecting data just the same as many A. E. S. members. They are enthused with the self-same ambition to tell their fellow platers what they have done. There is the chemist also who, being interested in electricity

and metallurgy, experiments with the electro-deposition of metals. His training enables him to observe and record things that so often pass unnoticed by those who daily come in contact with similar conditions. Such investigators take pride in contributing their results to the good work of advancing methods of operation in electroplating.

In nearly all fields of endeavor there are publications devoted to collecting and making known all the available work done along a special line. There is one notable exception, and that is, the direct field of electroplating.

Nothing could be more educative than to have the opportunity of reading a short review of the work done, the patents issued and the books published. Part of this is in a measure covered but more attention is given to original articles, which so often can be read in three or four different publications. This limits the amount of knowledge available to all the members of the society as it is only a few who have the privilege or opportunity of having access to all publications. To subscribe to all would be beyond the means of many.

This is a situation that should be met and corrected by the Monthly Review. In an endeavor to do so, a Publication Committee was appointed at the last convention. Plans are being formulated whereby all the available writings on electroplating, in a review form, will be placed before not only the platers who can attend branch meeting regularly but also be given to those less fortunately situated but who are just as thirsty for knowledge and just as anxious to be a well informed progressive plater.

This cannot be accomplished at once. It will require considerable work and, most of all, co-operation on the part of those who are able to assist. The start has been made and eventually the A. E. S. will have in reality a Monthly Review. —Publishing Committee, A. E. S.

RUSTPROOFING WITH LEAD

By a new method, it is possible to spread a lead coating on iron like paint. A pyrosol of lead in lead oxide is made by heating lead in an electric furnace under closely regulated conditions. The product, very finely powdered, is then dispersed in linseed oil and spread on a clean iron surface. This pigment yields metallic lead in a highly activated state and a film of lead forms on the iron. The coating is ex-

traordinarily adherent.—Zeitschr. angew. Chem., page 555 (1926). Industrial Gas, December, 1926.

PHILADELPHIA BRANCH

January meeting of Philadelphia Branch was held in the University of Pennsylvania on the 7th.

President Gehling started the meeting with a strong appeal for a larger attendance at the chemistry classes, and pressed upon the members the opportunity to make their plating problems lighter.

Messrs. Lunbeck, Barr and Seaser were appointed as a committee on convention papers.

Members who have not sent in the return postal cards for the research fund kindly do so to hasten this work.

Under Good and Welfare, the question was asked how to remove stains from stainless steel. Seven per cent hydrochloric pickle was suggested. Various subjects were discussed and proved interesting.

DETROIT BRANCH

Educational and business meeting of the Detroit Branch, A. E. S., held January 7 at the Detroit Testing Laboratory with a fair attendance with President J. Flanigan presiding.

Minutes of the previous meeting were read and approved. The evening was well spent listening to discussions on chromium plating. The discussion brought out the fact that we see a lot of samples of chromium plating floating around. But we still lack the real, honest-to-goodness dope on doing the same stuff on a production basis. It seems we are very far from it. It was suggested that the branch get up some plating equipment and do a lot of experimenting along that line and see if we can solve the mystery of chromium plating on a production basis.

The members were so interested in it that the meeting adjourned at a late hour.

C. Mascola, Secretary.

PITTSBURGH BRANCH

Our regular monthly meeting was held Saturday evening, January 8th, in the Down Town Y. M. C. A. We had a much better attendance than usual, and suppose our new central meeting place had much to do with it. Those present seemed to take new life and many suggestions were made that will, if carried out, make our meetings all that could be desired.

We had the pleasure of receiving two new applications, one for active and one for associate membership.

George Thompson, Active, 251 Meyran St., Pittsburgh, Pa.

Thomas Philip Thomas, Associate, Research Chemist, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

It has not been fully decided as to this meeting place, and the secretary was instructed to find if it will be possible to secure a suitable room in the building for a regular place for our meetings.

We had a lively discussion on generators and on some nickel solutions. Many of those present stated they would bring samples of their

work to the next meeting and show how they are obtaining deposits that are free of the usual defects.

We hope that, if the members will try and remember this and write up their methods, it will be helpful to the society.

NEWARK BRANCH

Newark Branch held its business meeting on December 17th with a large attendance. Vice President Charles Bohler occupied the chair in the absence of President Geo. Onksen. During the routine of business, Phil. Sievering, Treasurer of the 1926 convention, read the final report of receipts and expenditures and turned over a good sized check to the Newark Branch's bank account. A rising vote of thanks was given Mr. Sievering for his excellent work as Treasurer.

On January 21, 1927, an open meeting will be held at which time three or four speakers will give addresses.

Newark Branch voted to donate $10.00 to some needy family at Christmas.

Banquet Committee reported progress.

Mr. Roy Stout spoke on oxidizing brass plated die castings. Mr. Proctor recommended a solution composed of 1 gal. water, 8 oz. Hyposulphite of soda, 4 oz. acetate of lead, ½ oz. soda ash, to secure a black finish on brass plated die castings. Use as a dip at 180 deg. Fahrenheit.

Newark Branch held its January educational meeting on Friday, the 4th, President Onksen occupying the chair with 28 members present.

Discussion for the evening was the "Pitting of Nickel Deposits."

Mr. Geo. Hogoboom spoke on the causes of pitting, stating that air dissolved in the water used in making a nickel solution will cause it. Colloids in cleaners can also cause pittings. Controlling the pH eliminates pitts. Mr. Sievering stated that pitting can be stopped by acidifying the nickel electrolyte, then neutralize. Messrs. Sizelove, Graham, Sullivan, Calabrese, Onksen and Clark spoke on the eliminating of pitting.

Peroxide of hydrogen will immediately stop severe cases of pitting. Permanganate of potash is also used with good success as is sodium perborate.

Motion carried that Newark Branch go on record as stating that all data, both good and bad, found by the research chemists at the U. S. Bureau of Standards, be published in the A. E. S. Monthly Review.

Motion carried that Newark Branch wish Mr. Reuter good luck in his new position in Connecticut.

Mr. Bohler exhibited an article made of antimonial lead which had been copper-plated and brass plated lightly, with a pigment in background, and stated that he was informed that the deposit would vanish within one year through self-absorption.

Discussion or comment from other branches would be appreciated regarding the above. Royal F. Clark, Secy.-Treas.

TORONTO BRANCH

Toronto Branch held the last meeting for 1926 in Forester's Hall, 22 College street, and considering that it was the first Monday after

Christmas, we had a very good attendance. President W. S. Barrows welcomed the bunch with the yuletide handshake. After the reading of the minutes, bills, etc., the Secretary opened seven letters of correspondence from outside members, wishing the Toronto boys the compliments of the season, and showing an interest that was appreciated by all. Letter was read from Dr. McCoulough, Chief Health Officer of Ontario, stating that Drs. Cunningham and Bulmer would attend the January meeting.

One application was elected and two applications for membership were received.

It was decided to hold the annual Euchre in February.

QUESTION BOX

Question—Are iron hooks or anything in iron detrimental to a silver solution?

Answer—The members did not think so.

Question—What is a good formula for a cyanide copper solution?

Answer—3 oz. copper cyanide, 3¼ oz. sodium cyanide, 1 oz. sodium carbonate. Per gallon. Heat to Fahrenheit 120 when working.

Question—What is good for taking up excess acid in nickel plating solution?

Answer—Nickel carbonate if metal content is low; magnesium carbonate if metal content is sufficient.

Meeting adjourned 11:20.

Toronto Branch members send greetings to all who read the Monthly Review and wish them a Prosperous and a Happy New Year.

J. S. CAIRNS.

Henry Ford, in his concluding chapter of "The Great Today, the Greater Tomorrow" running in Boston Globe and New York American, says: "Morality is a part of good management. The social effect of this morality finds expression in devoting business to the service of the whole people instead of to the service of the few. The spirit of service is just a knowledge that no man can survive, no industry can survive, no government can survive, no system of civilization can survive, which does not continually give service to the greatest possible manner. There is no way out from poverty except through work. The world has tried everything but work, and the hardest of all work must come in the management. The majority of labor troubles are caused by managers who have no first-hand knowledge of labor."

"There may be room for you in the movies, young lady, but I think I ought to tell you that the profession is much overcrowded."

"Well, I guess all the other people will just have to take their chances."

APPLICATIONS

	Branches
Joseph Musunte, Jr., 4117 4th Ave., Brooklyn, N.Y. (Active)	New York
Chas. G. Miller, 308 68th St., Brooklyn, N. Y.	New York
Chas. Haushalter, 122nd St., Richmond Hill, L. I.	New York
John M. Russ, Jr., Munning & Co., Matawan, N. J.	Newark
Martin Phillips, 66 Herbert Ave., Toronto, Canada (Active)	Toronto
George Ellis Warbuck, 75 Margate St., Toronto, Can. (Active)	Toronto
Owen T. Towner, 1400 S. 4th Ave., Maywood, Ill. (Active)	Chicago
J. C. Youngblood, % Electric Storage Batt'y Co. (Active)	Philadelphia
R. C. Orves, Riverside Watch Case Co., N. J. (Active)	Philadelphia
W. H. Bannan, 150 N. 9th St., Reading, Pa. (Active)	Philadelphia
Grafton E. McGuire, East Orange, N. J. (Active)	Newark
George B. Shiverdecker, R. R. 4, Dayton, Ohio (Active)	Dayton
Thos. H. Cusick, 1616 Richard St., Dayton, Ohio	Dayton
Edward A. Suverkrof, Box 1019, Dayton, Ohio (Associate)	Dayton

ELECTIONS

George J. Klink, Milburn Ave., Milburn, N. J.	Newark
George Berduxe, 47 41st St., Irvington, N. J.	Newark
Fred C. Hurst, 145 Congress St., Jersey City, N. J.	Newark
Allen R. Groves, Box 415, Carlton Place, Ontario, Canada	Toronto
Armor Lee Walker, 368 W. Huron St., Chicago, Ill.	Chicago
A. C. Meyers, Box 191, Wilkinsburg, Pa.	Pittsburgh
Emil G. Nordblom, 36 Grant St., Jamestown, N. Y.	Rochester
Samuel Silverstein, 1926 Trumbull Ave., Chicago, Ill.	Chicago
Leonard R. Bartneck, 1715 Brigham St., Chicago, Ill.	Chicago
Johan A. Williamson, 2632 Mildred Ave., Chicago, Ill.	Chicago
John Christenson, 168 W. Oak St., Chicago, Ill.	Chicago
William P. Rice, 703 W. 32nd St., Kansas City, Mo.	Chicago
William Wickesser, Ridge Ave. and Noble St., Philadelphia, Pa., % Globe Plating Co.	Philadelphia
George B. Shiverdecker	Dayton
Thomas H. Cusick	Dayton
Edward A. Suverkrof	Dayton

RESIGNATIONS

William Donley, 111 Gunkle Ave., Dayton, Ohio	Dayton

SUSPENSIONS

A. C. Lamb	Indianapolis
A. W. Young	Indianapolis

CHICAGO BRANCH

Regular monthly meeting of Chicago Branch, A. E. S., was held Saturday evening, January 8th, 1927 at the Atlantic Hotel.

The meeting was called to order with President Jacob Hay presiding and all officers present. There was a large attendance.

Reports were heard from the Chairman of the Banquet Committee who reported that we expect this to be one of the largest banquets ever held.

The Librarian reported that the papers to be presented will be of a high grade and should be very interesting.

President Hay called upon some of the newly elected members who

were present and from their own words they seem more than satisfied having joined the society.

Mr. A. P. Munning of New York was visiting with us; he was also called upon. Mr. Munning spoke of the wonderful progress made in the art of electro-plating and this society.

The balance of the evening was given over to the Librarian who had several notes to read on chromium plating and spotting out, along with the question box.

Question Box, Chicago Branch, A. E. S.

Question 1. How much metal should a copper solution contain that is used to plate parts for localizing in case hardening?

Answer: If cyanide copper solution is used, 3 ounces of metal per gallon; if acid copper solution is used, up to 8 ounces of metal. .001 inch of copper deposit thought to be sufficient for localizing.

Question 2. What is the cause of a heavy scum on the anodes wire of a gold solution? The anode wire used is soft iron.

Answer. Iron wire with high carbon was stated to cause this scum. One member stated that he overcame this condition by only using pure iron wire.

Question 3. What is the best way to buff monel metal?

Answer. Mechanically if possible, using green chronic oxidize.

Question 4. What causes chromium to plate the color of cadmium? What is the true chromium color?

Answer. Too high current or too low temperature of the bath. Low cathode efficiency was also stated to cause this color. The true color is blue-gray.

Question 5. What proportion of steel balls should be used to the amount of work exposed in steel ball burnishing, and how is the size of balls determined?

Answer. One-third of burnishing ball full should be the right amount of balls for the general line of work. As to size, this can only be determined by the shape of work, size, etc.

Robert Meyers, Secretary.

YOU ARE INVITED

to attend the

Eighteenth Annual Founders' Day and Banquet

of the

NEW YORK BRANCH

at the Aldine Club, 200 5th Ave., New York City on

SATURDAY, FEBRUARY 19, 1927

The regular afternoon, 3 P. M., papers and addresses by prominent chemists and platers. Banquet at 7 P. M., and dancing afterwards. Do not forget! Bring the ladies for a pleasant afternoon and evening.

For further information, write to the Secretary, John E. Sterling, 2595 45th St., Astoria, L. I., N. Y.

Tickets $4.00 Each

BOSTON

Regular meetings are held first Friday of each month, at 8 p. m., at the Boston Platers' Supply Co., 202 Friend St., Boston. Secretary, A. W. Garrett, 24 Juliette St., Dorchester, Mass.

BRIDGEPORT

Meets first and third Friday of each month at 62 Cannon St., Room 17, Bridgeport, Conn. Secretary Wm. Ehrencrona, 872 Hancock Ave., Bridgeport, Conn.

CHICAGO

Meets second Saturday of each month, at 8 p. m., Atlantic Hotel, 316 S. Clark St. Secretary, Robt. Meyers, 2432 Wilson Ave., Chicago, Ill.

CINCINNATI

Meets every Thursday, 7:30 p. m., at Vocational Training School, Spring and Liberty St. Secretary, W. J. Husing, 729 McMakin Ave., Cincinnati, Ohio.

CLEVELAND

Meets nrst Saturday of each month at Hotel Winton. M. E. Zadowski, 6517 Bridge Ave.

HARTFORD-CONN. VALLEY

Meets rourth Monday in each month alternately at 266 Pearl St., Hartford, Conn., and corner Broadway and Worthington St., Springfield. Tennant Elwin, Secretary, 117 Hobart St., Meriden, Conn.

DAYTON

Meets first Saturday of each month at the Y. M. C. A., Dayton, Ohio. Secretary, Albert Bates, Box 34, Vandalia, Ohio.

DETROIT

Meets the first Friday of each month at the Detroit Testing Laboratory, 554 Bagley Ave., Detroit. Secretary, Chas. Mascola, 2041 Beard Ave., Detroit, Mich.

GRAND RAPIDS

Meets on the second Saturday of each month at the Vocational High School, 129 Bostwick Ave., N. E. Secretary, Jacob Van Dyke, 1361 Union Ave., N. E., Grand Rapids, Mich.

INDIANAPOLIS

Meets the second Saturday of each month at Hotel Denison. Secretary, Louis Mertz, 1725 Union St., Indianapolis, Ind.

MILWAUKEE

Meets second and fourth Thursdays of each month at Lipps Hall, 321 3d St. J. N. Hock, 1229 W. 24th St., Milwaukee, Wis.

MONTREAL

Meets last Friday of month at Office of Secretary, John H. Feelay, 411 Aylmer St., Quebec, Canada.

NEWARK

Meets first and third Fridays of each month at Franklin Hall, 41 Franklin St., Newark, N. J., at 8 p. m. Secretary-Treasurer, Royal F. Clark, P. O. Box 201, Newark, N. J.

NEW YORK

Meets every second and fourth Fridays of each month in the World Building, Park Row, New York City, N. Y. Secretary, J. E. Sterling, 2595 45th St., Astoria, L. I.

PHILADELPHIA

Meets first Friday of each month in the Harrison Laboratory Building, University of Pennsylvania, 34th and Spruce Sts. Secretary, P. Uhl, 2432 North 29th St., Philadelphia, Pa.

PITTSBURGH

Meets first Saturday of each month at 8 p. m., at United States Bureau of Mines Bldg., Forbes St. Secretary, S. E. Hedden, 227 Fifth St., Aspinwall, Pa.

PROVIDENCE-ATTLEBORO

Meets first and third Thursday of each month at 184 Washington St., Room 308, Providence, R. I. Secretary, J. H. Andrew, 19 Rosedale St., Providence, R. I.

ROCHESTER

Meets every third Friday of each month at the Powers Hotel. C. A. Reama, Secretary, 512 Lyell Ave., Rochester, N. Y.

ST. LOUIS

Meets first Friday of each month at Barr Branch Library, corner Jefferson and Lafayette Sts. Secretary, F. P. Menniges, 4019 Molozan Ave.

TOLEDO

Meets first Thursday of each month at Toledo University Science Building, Electro-Platers' Room, corner Cherry and Page Sts. Secretary, W. W. Weiker, 411 3d St., Toledo, Ohio.

TORONTO

Meets fourth Monday of each month at Canadian Foresters' Hall, 22 College St., Room No. 2. J. C. Cairns, 10 Wiltshire Ave., Toronto, Ontario, Canada.

WATERBURY

Meets every second and fourth Friday of each month. Secretary, Wm. F. Guilfoile, 14 Oakland Ave., Waterbury, Conn.